

### **AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

1-46. Cancelled.

47. (Currently Amended) A working system comprising:

- (a) a working machine for successively processing workpieces;
- (b) machine control means for determining a working condition of said working machine on the basis of an extraneous signal, and controlling said working machine according to the determined working condition;
- (c) a measuring device for measuring actual dimensions of working portions of the workpieces processed by said working machine; and
- (d) a feedback compensating apparatus used with said machine control means and said measuring device, said feedback compensating apparatus including:

determining means for determining, as the extraneous signal, a compensating value for adjusting the working condition of said working machine for the workpiece to be processed subsequently by said working machine, on the basis of the actual dimensions of the working portions of the workpieces which have been measured by said measuring device, and according to a compensation rule, the compensation rule changing such that the compensating value to be determined according to the

compensation rule is less responsive to a change in the actual dimensions of the processed workpieces when a frequency of a variation in a time of measurement of the actual dimensions successively obtained by said measuring device is higher than a threshold value, and the compensating value to be determined is more responsive to the change in the actual dimensions when the frequency of the variation in the time of measurement is equal to or less lower than the threshold value; and

applying means for applying the compensating value to said machine control means.

48. (Currently Amended) The working system of claim 47, wherein said feedback compensating apparatus includes memory means for storing data representative of a plurality of control rules, and means for selecting as the compensation rule one of the plurality of control rules depending on the frequency of the variation in the time of measurement.

49. (Currently Amended) The working system of claim 47, wherein said feedback compensating apparatus includes means for measuring the frequency of the variation in the time of measurement, adjusting a predetermined compensation rule depending upon the frequency of the variation in the time of measurement, and determining the compensating value according to the adjusted ~~compensating~~ compensation rule.

50. (Currently Amended) A method of processing a plurality of workpieces by a working system including a working machine for successively processing the workpieces, machine control means for determining a working condition of said working machine on [[a]] the basis of an extraneous signal, and controlling said working machine according to the determined working condition, and a measuring device for measuring actual dimensions of working portions of the workpieces processed by said working machine, said method comprising the steps of:

determining in said machine control means, as the extraneous signal, a compensating value for adjusting the working condition of said working machine for the workpieces to be processed subsequently by said working machine, on the basis of the actual dimensions of the working portions of the workpieces which have been measured by said measuring device, and according to a compensation rule, the compensation rule changing such that the compensating value to be determined according to the compensation rule is relatively less responsive to a change in the actual dimensions of the processed workpieces when a frequency of a variation in time of measurement of the actual dimensions successively obtained by said measuring device is higher than a threshold value, and the compensating value to be determined is more responsive to the change in the actual dimensions when the frequency of the variation in the time of measurement is equal to or less lower than the threshold value; and applying the compensating value to said machine control means.

51. (New) The working system of claim 47, wherein said measuring device comprises a post-process measuring device which is positioned relative to said working machine such that at least one pre-measured workpiece which has been processed by said working machine and which has not been measured by said post-process measuring device exists between said working machine and said post-process measuring device,

and wherein said determining means updates said compensating value from time to time on an intermittent basis while said workpieces processed by said working machine and existing between said working machine and said post-process measuring device are measured successively by said post-process measuring.

52. (New) The working system of claim 51, wherein said determining means updates said compensating value, such that said determining means changes said compensating value from a previous value to a present value, only after a first one of the workpieces processed by said working machine under the working condition adjusted by said previous value has been measured by said post-measuring device, whereby said compensating value is not updated for a period after said previous value is determined and before said first one of the workpieces has been measured.

53. (New) The working system of claim 51, wherein said determining means includes memory means for storing measured values of said actual dimensions of the processed workpieces obtained by said post-process measuring device, and determines a present value of said compensating value on the basis of a predetermined number of said measured values stored in said memory means, when the number of said measured values stored in said memory means has become equal to or larger than

said predetermined number, said determining means clearing said memory means and resuming an operation to store therein said measured values obtained by said postprocess measuring device, after completion of determination of said present value.

54. (New) The working system of claim 51, wherein said determining means includes memory means for storing measured values of said actual dimensions of the processed workpieces obtained by said post-process measuring device, and determines a present value of said compensating value on the basis of a predetermined number of said measured values stored in said memory means, when the number of said measured values stored in said memory means has become equal to or larger than said predetermined number, said determining means clearing said memory means and resuming an operation to store therein said measured values obtained by said post-process measuring device, after a moment when said measuring device has measured a first one of the workpieces processed by said working machine under the working condition adjusted by said present value.

55. (New) The working system of claim 54, wherein said determining means effects primary compensation and auxiliary compensation to update said compensating value,

said primary compensation comprising determining a primary compensating value on the basis of a predetermined first number of said measured values stored in said memory means, when the number of said measured values stored in said memory means has become equal to said predetermined first number,

said auxiliary compensating comprising continuing to store said measured values in said memory means even after completion of determination of said primary

compensating value, and determining a present provisional compensating value on the basis of a predetermined second number of said measured values stored in said memory means, when each of the processed workpieces is measured by said post-process measuring device, during a time period between a moment of the completion of determination of said primary compensating value and a moment not later than a moment when a workpiece immediately preceding a first one of the workpieces processed by said working machine under the working condition adjusted by said primary compensating value has been measured by said post-process measuring device, said determining means determining as a final auxiliary compensating value a difference of said present provisional compensating value from a last provisional compensating value which immediately precedes said present provisional compensating value, said primary compensating value being used as said last provisional compensating values upon determination of said final auxiliary compensating value for the first time,

said determining means clearing said memory means and resuming an operation to store therein said measured values obtained by said post-process measuring device, after a moment when said post-process measuring device has measured said first one of the workpieces,

said applying means applying said primary compensating value and said final auxiliary compensating value to said machine control means.

56. (New) The working system of claim 55, wherein said determining means includes a counter for counting the number of said final auxiliary compensating values successively determined in said auxiliary compensation, said determining means

terminating said auxiliary compensation if a sum of at least a predetermined number of said final auxiliary compensating values when the counted number of the determined final auxiliary compensating values has become equal to said predetermined number, is not substantially equal to zero, and continuing said auxiliary compensation with said counter cleared, if said sum is substantially zero.

57. (New) The working system of claim 51, wherein said determining means includes memory means for storing measured values of said actual dimensions of the processed workpieces obtained by said post-process measuring device, and determines a present value of said compensating value on the basis of a predetermined number of said measured values stored in said memory means, when the number of said measured values stored in said memory means has become equal to or larger than said predetermined number, said determining means clearing said memory means after completion of determination of said present value,

said determining means obtaining as estimated value of said actual dimensions of the workpieces, on the basis of said present value of said compensating value and a present one of said measured values, when each of the processed workpieces is measured by said post-process measuring device to obtain said present one of said measured values, during a time period between a moment when said operation to store said measured values in said memory means is resumed and a moment not later than a moment when a workpiece immediately preceding a first one of the workpieces processed by said working machine under the working condition adjusted by said present value of said compensating value has been measured by said post-process measuring device, said determining means determining said estimated

value as a dimension of the workpiece which would be measured by said post-process measuring device if said workpiece were processed under the working condition of said working machine adjusted by said present value of said compensating value, said determining means storing said estimated value in said memory means as said actual dimension of said workpiece immediate preceding said first one of the workpieces, each time said estimated value is obtained during said time period.

58. (New) The working system of claim 51, wherein said determining means includes memory means for storing measured values of said actual dimensions of the processed workpieces obtained by said post-process measuring device, and said determining means effects primary compensation and auxiliary compensation to update said compensating value,

said primary compensation comprising determining a primary compensating value on the basis of a predetermined first number of said measured values stored in said memory means, when the number of said measured values stored in said memory means has become equal to said predetermined first number,

said auxiliary compensation comprising continuing to store said measured values in said memory means even after completion of determination of said primary compensating value, and determining a present provisional compensating value on the basis of a predetermined second number of said measured values stored in said memory means, when each of the processed workpieces is measured by said post-process measuring device, during a time period between a moment of the completion of determination of said primary compensating value and a moment not later than a moment when a workpiece immediately preceding a first one of the workpieces



processed by said working machine under the working condition adjusted by said primary compensating value has been measured by said post-process measuring device, said determining means determining as a final auxiliary compensating value a difference of said present provisional compensating value from a previous provisional compensating value which immediately precedes said present provisional compensating value, said primary compensating value being used as said last provisional compensating values upon determination of said final auxiliary compensating value for the first time,

said determining means clearing said memory means after completion of said auxiliary compensation, and obtaining an estimated value of said actual dimensions of the workpieces, on the basis of said final auxiliary compensating value and a present one of said measured values, when each of the processed workpieces is measured by said post-process measuring device to obtain said present one of said measured values, during a time period between a moment when said operation to store said measured values in said memory means is resumed and a moment not later than a moment when a workpiece immediately preceding a first one of the workpieces processed by said working machine under the working condition adjusted by said primary compensating value has been measured by said post-process measuring device, said determining means determining said estimated value as a dimension of the workpiece which would be measured by said post-process measuring device if said workpiece were processed under the working condition of said working machine adjusted by said present value of said compensating value, said determining means storing said estimated value in said memory means as said actual dimensions of said

workpiece immediately preceding said first one of the workpieces, each time said estimated value is obtained during said time period,

said applying means applying said primary compensating value and said final auxiliary compensating value to said machine control means.

59. (New) The working system of claim 58, wherein said determining means includes a counter for counting the number of said final auxiliary compensating values successively determined in said auxiliary compensation, said determining means terminating said auxiliary compensation if a sum of at least a predetermined number of said final auxiliary compensating values when the counted number of the determined final auxiliary compensating values has become equal to said predetermined number, is not substantially equal to zero, and continuing said auxiliary compensation with said counter cleared, if said sum is substantially zero.